

# **DUSTPROOF PLATE FIXTURE FOR AN ELECTRICAL CONNECTOR**

## **CROSS REFERENCE**

The present invention is a continuation in part (CIP) of the co-pending application 10/162,517 filed on June 3, 2002 by the same applicant of the referenced application, now abandoned.

## **BACKGROUND OF THE INVENTION**

### **1. Field of the Invention**

The present invention relates to a dustproof plate fixture, and more particularly to a dustproof plate fixture adapted to securely connect the dustproof plate to a back of an electrical connector.

### **2. Description of Related Art**

It is found that dust and moisture can penetrate to the interior of electrical connectors, whereby performance of the connector is impaired. To try to prevent this a dustproof plate is mounted on a back of a connector so as to isolate the dust, moisture etc. A conventional dustproof plate is shown in Fig. 6, wherein the dustproof plate (3) has a wedge (32) formed on a top edge of the dustproof plate (3) and two steps (31) respectively formed on opposite sides of the dustproof plate (3). An electrical connector (2) has a cutout (231) defined in a rear side face of the connector (2) to correspond to the wedge (32), and two tracks (21) respectively formed on two opposite sides of the connector (2) to correspond to the two steps (31).

When the conventional dustproof plate (3) is to be mounted on the connector (2), the steps (31) of the dustproof plate (3) are first slid into the corresponding tracks (21). After the steps (31) are inserted and slid into the tracks (21), the wedge (32) is securely received in the cutout (231) so that the dustproof plate (3) is able to prevent dust and

1 moisture from going into the interior of the connector (2) to influence the electrical  
2 performance of the connector (2).

3 From the structure of the dustproof plate (3) and the corresponding structure of  
4 the connector (2), it is to be noted that the dustproof plate (3) has constant friction with  
5 the connector (2) when mounting and de-mounting the dustproof plate (3) to the  
6 connector (2). That is, a friction is generated between the steps (31) and the side walls  
7 defining the tracks (21) and it will gradually reduce the tightness between the dustproof  
8 plate (3) and the connector (2). When small rifts happen due to the friction between the  
9 dustproof plate (3) and the connector (2), the electrical performance is greatly hindered.

10 To overcome the shortcomings, the present invention tends to provide an  
11 improved dustproof plate fixture to mitigate and obviate the aforementioned problems.

## 12 SUMMARY OF THE INVENTION

13 The primary objective of the present invention is to provide an improved  
14 dustproof plate fixture for an electrical connector so as to eliminate the possibility of  
15 having friction between the dustproof plate and the connector and thus maintain the  
16 tightness therebetween.

17 Another objective of the present invention is that the dustproof plate has a  
18 bottom face tapered in thickness such that when the pins of the electrical connectors are  
19 welded to the housing of the electrical connector, damage to the pins is minimized.

20 Still another objective of the present invention is that the dustproof plate has  
21 positioning bosses formed on a rear face of the dustproof plate to correspond to the  
22 positioning holes in the housing such that when the dustproof plate is engaged with the  
23 housing, the mutual corresponding relationship between the positioning bosses and the  
24 positioning holes enhances the engagement between the housing and the dustproof

1 plate.

2 In order to accomplish the foregoing objective, the dustproof plate fixture of the  
3 present invention includes a pair of retainers respectively adjacent to a side of a  
4 dustproof plate, a pair of pressing elements respectively corresponding to and engaging  
5 with one of the retainers and two securing elements adapted to extend through a cover, a  
6 housing, a corresponding one of the retainers and into a corresponding one of the  
7 pressing elements to secure engagement between the pressing element and the retainer  
8 such that the pressing elements, the retainers, the housing and the cover are securely  
9 connected to one another.

10 Other objects, advantages and novel features of the invention will become more  
11 apparent from the following detailed description when taken in conjunction with the  
12 accompanying drawings.

### 13 BRIEF DESCRIPTION OF THE DRAWINGS

14 Fig. 1 is an exploded perspective view of the dustproof plate fixture in  
15 association with the electrical connector;

16 Fig. 2 is a perspective view showing the assembly of the dustproof plate fixture  
17 with the securing element left outside the assembly;

18 Fig. 3 is a perspective view showing the complete assembly of the electrical  
19 connector;

20 Fig. 4 is a cross sectional view showing internal structure of the electrical  
21 connector according to line 4-4 in Fig. 3;

22 Fig. 5 is a partial cross sectional view showing that the dustproof plate has a  
23 bottom face tapered in thickness such that the pins of the electrical connector are  
24 protected from damage during welding process;

Fig. 5A is a perspective view of the dustproof plate fixture from a different angle relative to that of Fig. 2;

Fig. 5B is a partial cross sectional view by taking line 5B-5B in Fig. 5A; and

Fig. 6 is a perspective view showing the structure of the conventional dustproof plate and the corresponding structure in the electrical connector.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to Fig. 1, it is to be noted that the dustproof plate fixture for an electrical connector has a cover (1) having a pair of opposite connection holes (11), a housing (2) attached to and engaged with the cover (1), and pins (3) supported by the housing (2) and extending out of the cover (1).

The dustproof plate fixture in accordance with the present invention has two cutouts (41) adapted to be defined in opposite sides of a dustproof plate (4), a first step (42) and a second step (43) formed on the first step (42), a pair of retainers (5) and a pair of pressing elements (6). A pair of positioning bosses (44) is adapted to be defined in a rear face of the first step (42).

A recess (21) is adapted to be defined in a rear face of the housing (2) and two positioning holes (22) are adapted to be defined in opposite sides of a bottom face defining the recess (21) to correspond to the positioning bosses (44). A first support (23) and a second support (24) are oppositely formed on the bottom face defining the recess (21) to correspond to the dustproof plate (4). Two combining holes (25) are oppositely defined in the housing (2). It is appreciated that the housing (2) has multiple insertion holes (20) defined in the rear face of the housing (2) for extension of the pins (3).

Each retainer (5) is defined with a base plate (51), a through hole (52) defined through the base plate (51) to correspond to one of the combining holes (25) of the

1 housing (2), and extension legs (53) extending from a bottom face of the base plate (51).

2 Each pressing element (6) is provided with a pressing plate (61), a sleeve (62)  
3 extending from a rear face of the pressing plate (61) and a threaded hole (62) in  
4 communication with the sleeve (62) and corresponding to the through hole (52) of the  
5 retainer (5).

6 With reference to Figs. 2, 3 and 4, when the electrical connector is to be  
7 assembled, the pins (3) are inserted into the insertion holes (20) of the housing (2) and  
8 extend out of the cover (1) where the combining holes (25) are aligned with the  
9 connection holes (11). Then the first step (42) of the dustproof plate (4) is supported and  
10 received in the recess (21) with the positioning bosses (44) received in the positioning  
11 holes (22). Due to the formation of the recess (21) and the first step (42), the  
12 combination of the dustproof plate (4) and the housing (2) is compact. Thereafter, the  
13 two retainers (5) are placed adjacent to opposite sides of the first step (42) of the  
14 dustproof plate (4) with the through holes (52) respectively aligned with one of the  
15 combining holes (25). Then the two sleeves (62) are extended into the through holes  
16 (52), the combining holes (25) and the connection holes (11), wherein the pressing plate  
17 (61) is securely engaged with a corresponding one of the base plates (51). It may be  
18 appreciated that after the sleeves (62) are extended into the connection holes (11), distal  
19 ends of the sleeves (62) are flush with a rear face of the cover (1). Last, two securing  
20 elements (not shown), preferably threaded bolts, are implemented to extend into the  
21 connection holes (11) and the threaded holes (63) to secure engagement of the retainers  
22 (5), the dustproof plate (4), the housing (2) and the cover (1).

23 With reference to Figs. 5, 5A and 5B, it is noted that the dustproof plate (4) has a  
24 bottom face (45) tapered in thickness such that when the pins (3) are welded to the

1 housing (2), the welding process is easy to proceed such that the pins (3) are protected  
2 from damage.

3 It is to be understood, however, that even though numerous characteristics and  
4 advantages of the present invention have been set forth in the foregoing description,  
5 together with details of the structure and function of the invention, the disclosure is  
6 illustrative only, and changes may be made in detail, especially in matters of shape, size,  
7 and arrangement of parts within the principles of the invention to the full extent  
8 indicated by the broad general meaning of the terms in which the appended claims are  
9 expressed.